



DIESEL PARTS OF AMERICA

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DPA - 240 USER'S MANUAL



DPA-240 Worldwide approved entities.



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Introduction

Thank you for your recent DPA-240 purchase. We appreciate your business and are pleased to add your name to our growing list of customers. You have invested in the highest quality equipment available. Now, please take a few minutes and read this booklet. This will familiarize you with the benefits you will receive from the equipment you just purchased and help you understand the testing routine that will be required.

This manual has been prepared especially for use in familiarizing personnel with the design, installation and operation of this equipment. All information presented herein should be given careful consideration to assure optimum performance of this equipment.

All information, illustrations, photographs and specifications contained in this manual are based on the latest product information available at the time of publication. Due to improvements or other changes, there will be some discrepancies in this manual. We reserve the right to make product changes at any time, without notice and without incurring any obligation to make the same or similar changes to the tester previously built or sold.

Safety

The following definitions apply to **CAUTION**, **IMPORTANT**, and **NOTE** blocks found throughout this manual;



CAUTION

Under this heading, installation and operating procedures or practices will be found that if not carefully followed may create a hazard to personnel



IMPORTANT

Under this heading, installation and operating procedures or practices will be found that if not carefully followed may result in damage to equipment.



NOTE

Under this heading, explanatory statements will be found that need special emphasis to obtain the most efficient operation of this equipment.



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General

The DPA-240 is a standard alone machine designed to test **HEUI (Hydraulically activated electronically mechanically controlled injectors)** and **EUI (electronically activated mechanically controlled injectors)**. It features a graduate metering system and a comprehensive electronic control, enabling a full range of tests to be performed.

The machine incorporates a single test oil supply with fuel and hydraulic pressures controlled individually.

Injector Control Features:

- **Auto** pulse width control from 0.05 to 3 Ms equivalent to injection duration.
- Shot count control up to 1000 shots, and continuous operation
- HEUI Variable simulated RPM's in a wide range of tests (from 300 to 2000 RPM)
- Test tube time control from 1 sec to 60 sec.

Information Table:

Power Supply:	210-220 Volts, 60 Hertz
Fuel Pump Motor power:	1 HP
Hydraulic Pressure Motor power:	7.5 HP
Cam-Box Motor power:	5 HP
Tank Capacity:	200 Liters
Net Weight:	650 Kg
Dimensions (as a square):	172 cm X 120 cm X 80 cm
Fuel Pressure	0 to 300 PSI
Hydraulic Pressure	0 to 2000 PSI
Graduates Volume	0 to 250 ml

DPA-240 injectors capable to test:

- 7.3 L **HEUI** Ford* Power Stroke / International* T444 / DT 466E / I530 E / CAT Injector
- 6.0 L & 4.5 L **HEUI** Ford* Power Stroke / International* Injector
- CAT* 3126A / **HEUI** 3116 Injector
- Cummins* Celect* N-14 / M-11 **EUI** Injector
- Detroit Diesel Series 60* **EUI** Injector
- CAT* 3406E **EUI** Injector



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Testing Parameters Block Diagram

DPA-240

HEUI Injector Test

(Hydraulic Electronic Unit Injector)
Works with Hydraulic Pressure

EUI Injector Test

(Electronic Unit Injector)
Works with a CAM

7.3 L HEUI Ford* Power Stroke / International* T444 / DT 466E / I530E / CAT* Injector

Testing Speed	300 to 2000 RPM
Hydraulic Press.	750 to 1000 PSI
Fuel Press.	60 to 150 PSI
Test Tube Time	28 to 32 sec.

Cummins* Celect*, N-14 / M-11 EUI Injector

Testing Speed	900 RPM Fixed
Hydraulic Press.	Not Available
Fuel Press.	60 to 150 PSI
Test Tube Time	28 to 32 sec.

6.0 L & 4.5 L HEUI Ford* Power Stroke / International* Injector

Testing Speed	300 to 2000 RPM
Hydraulic Press.	750 to 1000 PSI
Fuel Press.	60 to 150 PSI
Test Tube Time	28 to 32 sec.

Detroit Diesel Series 60* EUI Injector

Testing Speed	900 RPM Fixed
Hydraulic Press.	Not Available
Fuel Press.	60 to 150 PSI
Test Tube Time	28 to 32 sec.

CAT* 3126A / HEUI 3116 Injector

Testing Speed	300 to 2000 RPM
Hydraulic Press.	750 to 1000 PSI
Fuel Press.	60 to 150 PSI
Test Tube Time	28 to 32 sec.

CAT* 3406E EUI Injector

Testing Speed	900 RPM Fixed
Hydraulic Press.	Not Available
Fuel Press.	60 to 150 PSI
Test Tube Time	28 to 32 sec.



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Installation

For your safety, and to maximize the service life of your equipment, it is very important to take a few moments before you operate the tester to check its condition. Be sure to take care of any problem you find, before you operate the tester.



IMPORTANT

Every step must be chronologically followed in order to get the best possible results.

The DPA 240 basically needs three main conditions to work, Hydraulic oil (for the 200 liter tank), gear transmission oil (for the CAM-BOX), and Electrical Power Supply.

1. - Fill the oil tank with **180 liters** with any of the next Hydraulic oil Brand specifications:

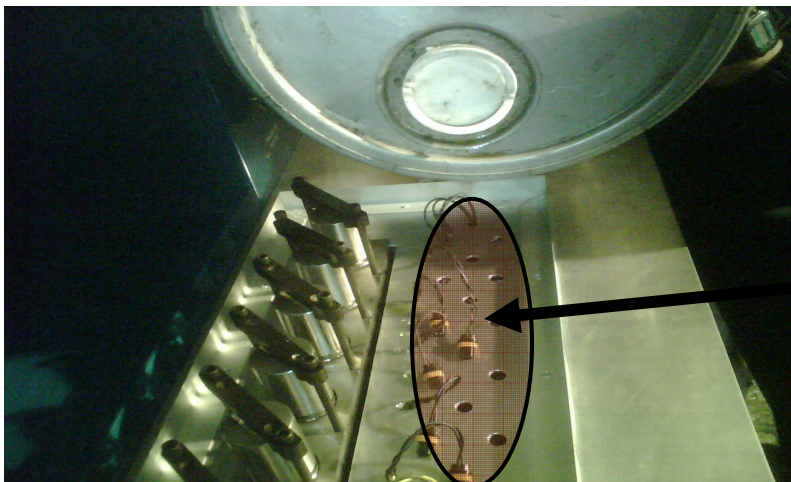
Mobil*	DTE - 24
Esso*	NUTO - H32
Elf*	DTH32 HF - 2
Quaker*	SPEED OIL LIGHT
Texaco*	RANDO 32
Shem*	HYDRO-32

NOTE

NOTE

In order to maintain always the same oil temperature it is necessary to fill the tank with at least 180 oil liters, (check with DIP STICK)

Remove the acrylic protection and fill the Hydraulic oil in the tank as shown in the picture:



Fill the oil in this Area.



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2. - Fill the CAM BOX with 2 liters of gear transmission oil with next gear transmission oil Brand specifications (GENERAL OIL, SAE 250):

Quaker State*	Green Oil SAE 250
Texaco*	Thuban SAE 250
Shell*	Dentax SAE 250

The gear transmission Oil must be filled in the CAM BOX as shown in the picture:



IMPORTANT

Do not overfill the CAM BOX with the gear transmission oil, if there is too much oil it can cause oil leakage from the CAM BOX at work

3.- Now we proceed to connect the DPA-240 to the electrical power supply.

The DPA-240 power supply specification is: **210-220 Volts @ 60 Hertz.**
With **NO** ground/neutral connection (all the motors from the pumps and CAM BOX such as the pulse box generator are 3 phases electrically wired and does not need an electrically ground/neutral connection as in accordance with the National Electrical Code)



CAUTION

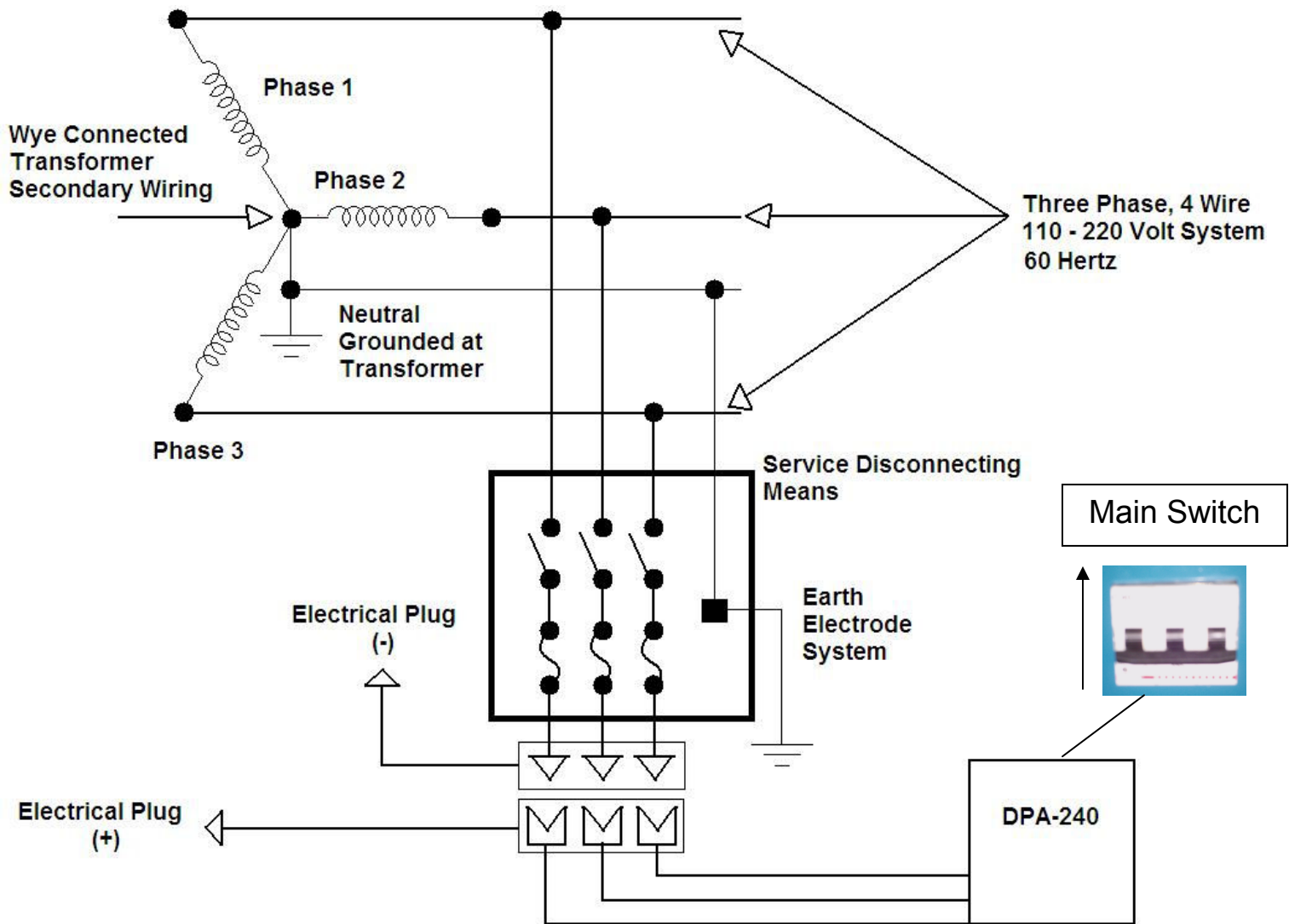
Risk of electric shock may cause death or serious body injury such as electrical damage to the tester



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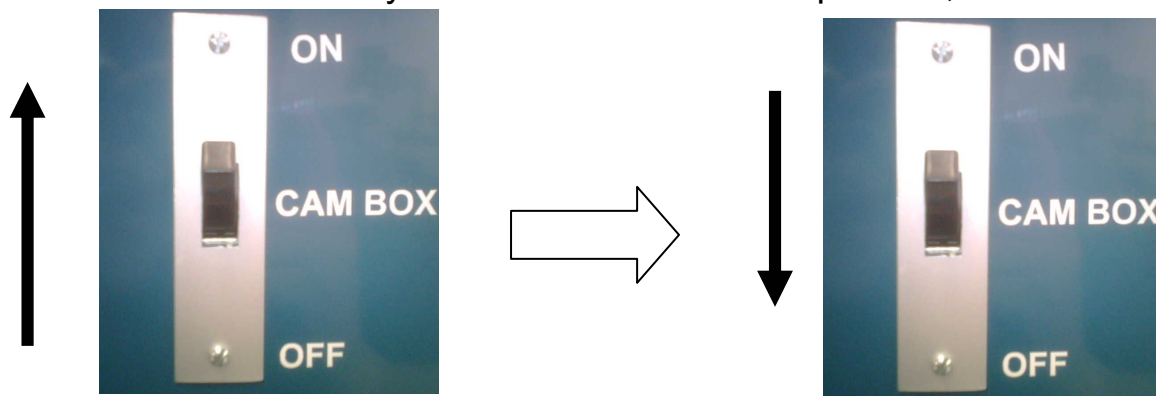
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Power supply must be connected as shown in the next electrical diagram:



After we have connected the DPA-240 tester to the electrical supply, we have to check that the electrical motors are correctly spindle orientated in order for the tester to work properly. We can check this with this single steps:

1.- Open the CAM-BOX side door and turn on the CAM BOX, with the sliding switch in the "ON" direction and Immediately slide the switch to "OFF" position, as shown in the picture



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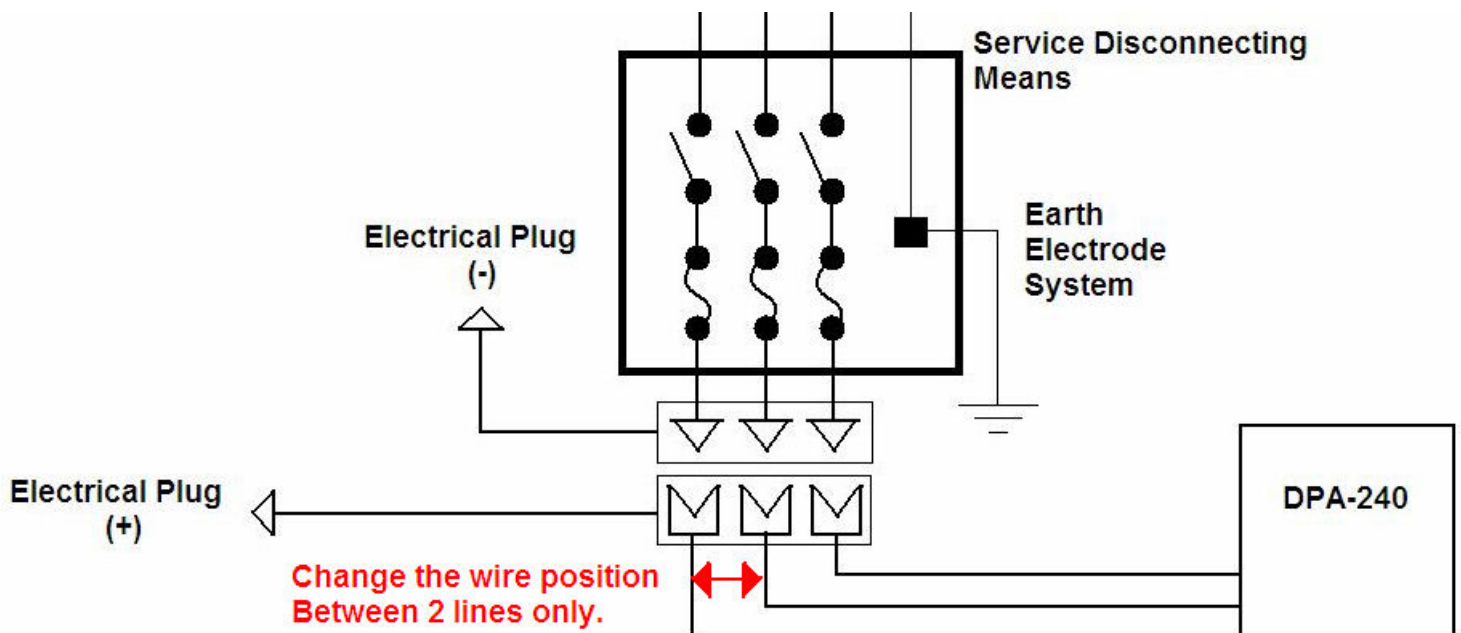
2. - Verify that the spindle direction of the CAM BOX is clockwise as shown and close de CAM-BOX side door:



CAUTION

Keep out from all moving parts when installing or testing with the machine

If the spindle direction of the CAM BOX is correct, the DPA-240 is ready to start testing Injectors, if not, disconnect the main switch, and correct the electrical supply diagram connections as shown, then connect the main switch and repeat the last 2 steps.

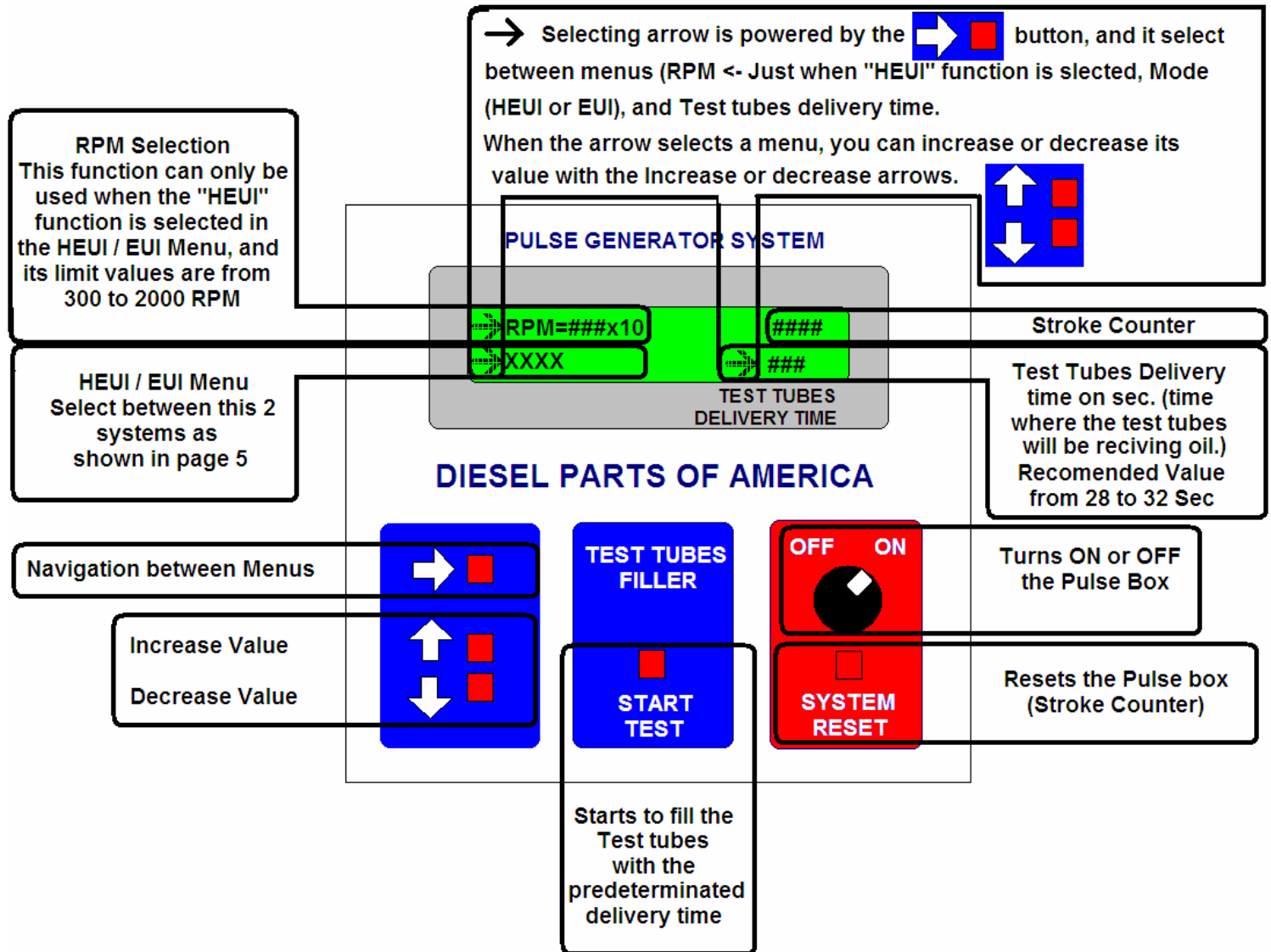


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Pulse Box Generator Functions

The pulse box generator has 3 main selectable parameters, but in order to understand them, first of all we have to recognize the Pulse Box panel functions and block diagram.



NOTE

NOTE

The test tubes filler button is independent from all the other pulse box functions, and once the delivery time starts running, it is not possible to stop this function until the delivery time finishes.



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DPA-240 testing method and Parts

For testing EUI / HEUI injectors, this is the main methodology:



IMPORTANT

Every step must be chronologically followed in order to get the best possible results.

- 1.- **Clean the injector / injectors in its internal / external parts, before testing, to avoid oil contamination.**
- 2.- Place the injector / injectors in its testing place (CAM BOX, or HEUI adapters) with its accessories (if necessary)
- 3.- Turn on the Pulse Generator Box and set its parameters (HEUI or EUI mode, RPM's <- just in the HEUI mode, Test tube times, etc), then check that the solenoid is really working (you can check this by the sound it generates when opening and closing the poppet valves)
- 4.- Turn on the Hydraulics and fuel pump or just the fuel pump (depending on the testing system, EUI or HEUI), and rise to the desired pressure value.
- 5.- Turn on the CAM BOX (only when testing EUI systems)

NOTE

NOTE

Remember that the EUI injector systems only works with a CAM, and Fuel pressure

- 6.- Check the fuel delivery in the test tubes, pressing the “Start Test” button.
- 7.- After finishing the test / tests, turn off the Hydraulics and fuel pump or just the fuel pump (depending on the testing system, EUI or HEUI).
- 8.- Turn off the CAM BOX (only when testing EUI systems)
- 9.- Turn off the Pulse Generator Box and **Main Switch after all the testing has been performed**
- 10.- Place their accessories / protective case (acrylics, dummy injectors, etc)



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Recognize the main DPA-240 controls panel

Hydraulic Pressure switch



Hydraulic Pressure Regulator and Manometer



Fuel Pump switch



Fuel Pump Pressure Regulator and Manometer



CAM BOX switch



Pulse Box switch

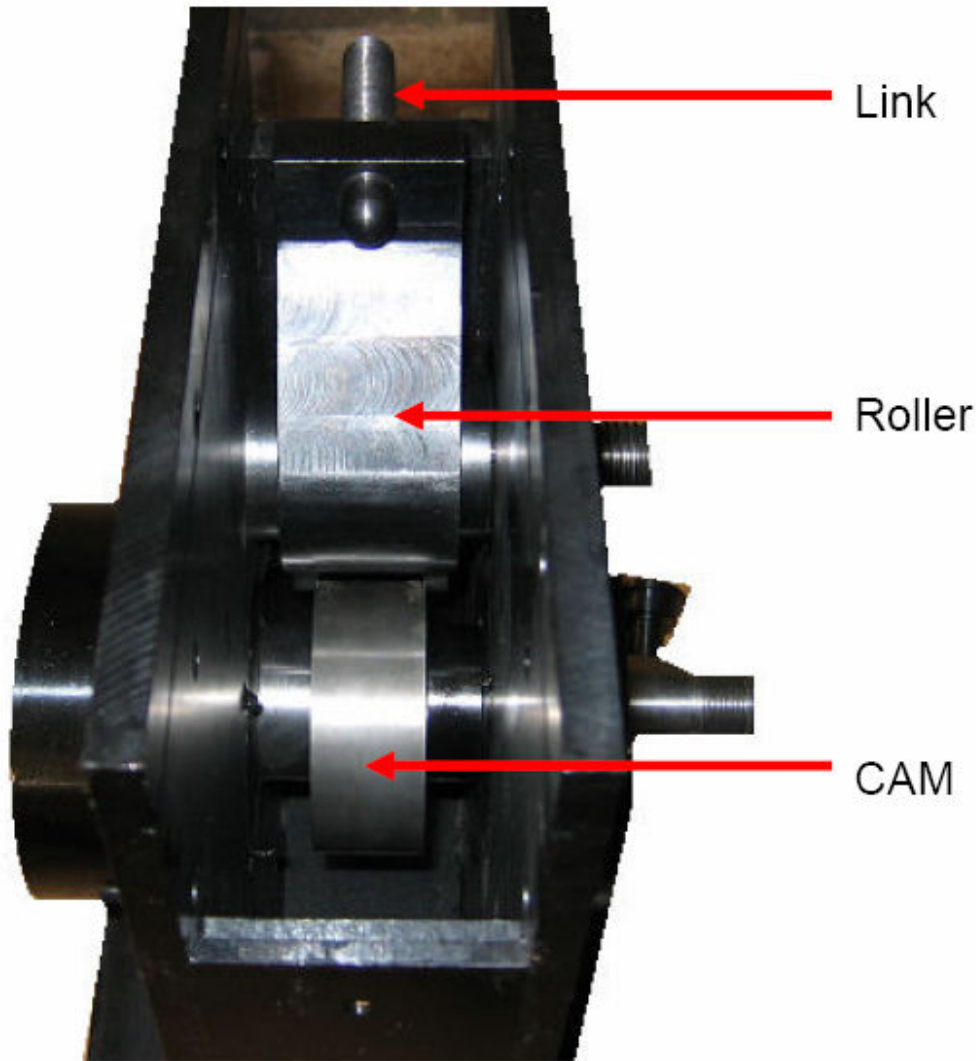


CAM BOX Description

The CAM BOX works with a universal CAM, capable to test virtually all EUI Injectors and EUP (Electronic Unit Pumps) available on the market (If you need more testing adapters for other types of injectors, or EUP pumps, please ask for more information with your local DPA Dealer), this eliminates the assembly and disassembly job of changing CAMS, since 1 CAM works with all EUI injectors and EUP pumps.

The diagram of the CAM BOX is as shown:

A CAM is dragged by the electrical motor, which is in contact with a roller; this roller on the top has attached a link that must be connected to the EUI Injector / EUP pump.



NOTE

NOTE

In this DPA-240 version, this CAM BOX only works at 900 RPM's



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HEUI Injector Tests

7.3 L HEUI Ford* Power Stroke / International* T444 / DT 466E / I530E / CAT* Injector

MODE:	Hydraulic Pressure	Fuel Pressure	Test Tube Time	Pulse Box RPM's
HEUI				
Required Parameter	YES	YES	YES	YES
Parameter Values	750 to 1000 PSI	60 to 150 PSI	28 to 32 Sec	300 to 2000 RPM
Recomended Value	750 PSI	100 PSI	30 Sec	Low, 300 RPM Mid, 900 RPM High, 1200 RPM

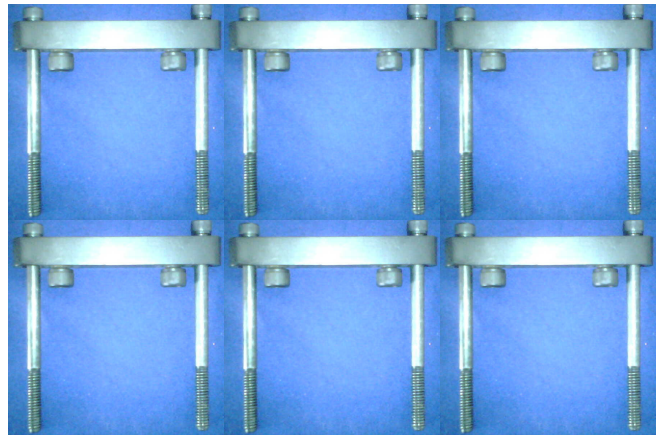
Able to test injectors at a time: **6**

Accessories to be used for testing these injectors

6- Dummy Injectors



6- Injector Retaining Adapters



Testing Sequence:



IMPORTANT

Every step must be chronologically followed in order to get the best possible results.

1.- Take out the dummy injectors from the HEUI testing adapters.



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NOTE

NOTE

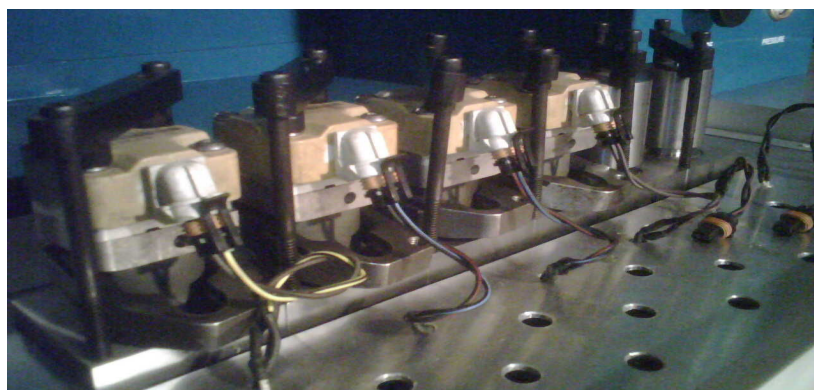
You can test 6 injectors at a time or less number of injectors, placing in the missing adapters the Dummy injectors, these injectors will play as a plug, for not losing hydraulic pressure. **Never leave an empty adapter space when testing.**



IMPORTANT

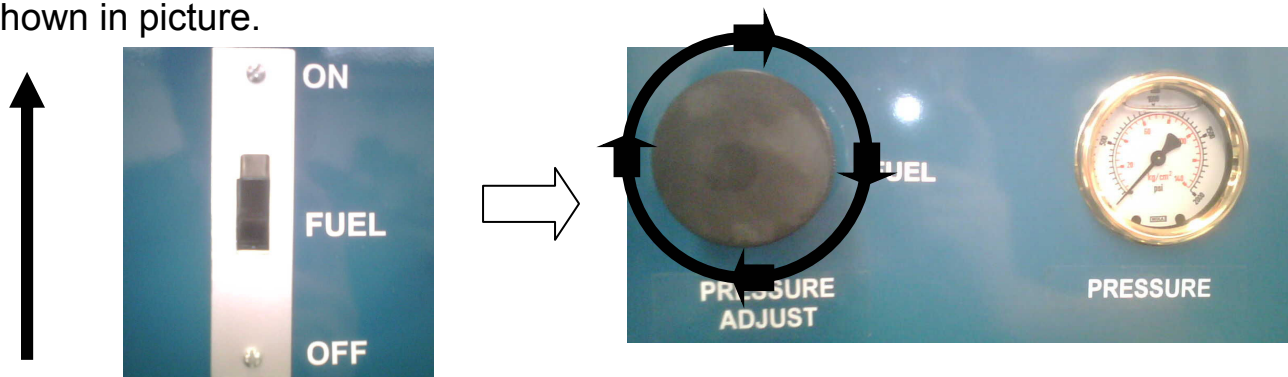
Before testing, make sure that all the injectors are cleaned in its inside / outside parts, this is to avoid oil contamination

2.- Place the injector/s in the HEUI adapter spaces, and make sure that they are strongly clamped to the adapter base with the Injector retaining adapters. (Also Dummy injector/s, if placed), plug them with the provided RED TAG harnesses (where available) and cover them with the acrylic protection as shown in the picture. (Also make sure that the BLUE TAG Harness, the GREEN and YELLOW TAG harnesses are not connected so as in **Short Circuit**)



3.- Turn on the Pulse Box, and set the testing parameters (HEUI mode, Test tube delivery time and RPM's). Now you will hear the sound of the Injector/s Poppet Valves working at the specified RPM's.

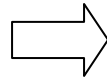
4.- Move the Fuel Pressure switch to "ON" position, and rise the fuel pressure with the fuel pressure valve (moving clockwise) to the desired fuel pressure (we recommend 100 PSI) as shown in picture.



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5.- Press the Hydraulic pump switch to “ON”, and rise the oil pressure with the oil pressure valve (moving clockwise) to the desired oil pressure (we recommend 750 PSI) as shown in picture.



6.- Now injectors should start working. You will see how the injector/s releases oil pressure in the adapters area, and they start to deliver oil (that plays the fuel role), in the back area of the test tubes, as shown in picture.



NOTE

NOTE

When testing for the very first time, perform the test with clean and pre-checked working injectors.

7.- Leave working this injector/s for about 20 seconds before checking fuel delivery, this is for the injector/s to eliminate air bubbles from its mechanism.

8.- Press the “Start Test” button in the Pulse Box panel to check the fuel delivery in the test tubes for the desired pre-set time, then drain the oil from the test tubes.

9.- Repeat step 8 as many times as required until the fuel delivery reading gets stable.

10.- Change the RPM's in the Pulse Box panel as desired (Low, mid or high RPM's), and re-arrange the fuel and oil pressures to the desired parameters, this helps us to get steady fuel delivery readings (moving the pressure valves clockwise or counter-clockwise), and repeat step 8 as many times as required until the fuel delivery readings gets stable in each desired RPM Parameter.



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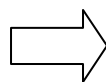
NOTE

NOTE

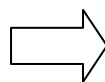
Take note of the fuel delivery readings and testing parameters and compare between them. This is the main purpose of the tester. **This tester does not fix injectors, just compares between them**

Turn off sequence

11.- After all testing has been performed, we proceed to turn off the tester. First, decrease the oil pressure with the oil pressure valve (moving counter-clockwise) to **almost 0 PSI**, and press the Hydraulic pump switch to “OFF”. As shown in picture.



12.- Decrease the fuel pressure with the fuel pressure valve (moving counter- clockwise) to **almost 0 PSI**, then move the Fuel Pressure switch to “OFF” position. As shown in picture.



13.- Turn “OFF” the pulse box

14.- Unplug Harnesses, take out the injectors and then place the Dummy Injectors in the adapter spaces, and cover them with the acrylic protection. This is for avoiding dust or contamination in the internal piping system.

15.- Testing cycle finished.



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6.0 L & 4.5 L HEUI Ford* Power Stroke / International* Injector

MODE:	Hydraulic Pressure	Fuel Pressure	Test Tube Time	Pulse Box RPM's
HEUI				
Required Parameter	YES	YES	YES	YES
Parameter Values	750 to 1000 PSI	60 to 150 PSI	28 to 32 Sec	300 to 2000 RPM
Recomended Value	750 PSI	100 PSI	30 Sec	Low, 300 RPM Mid, 900 RPM High, 1200 RPM

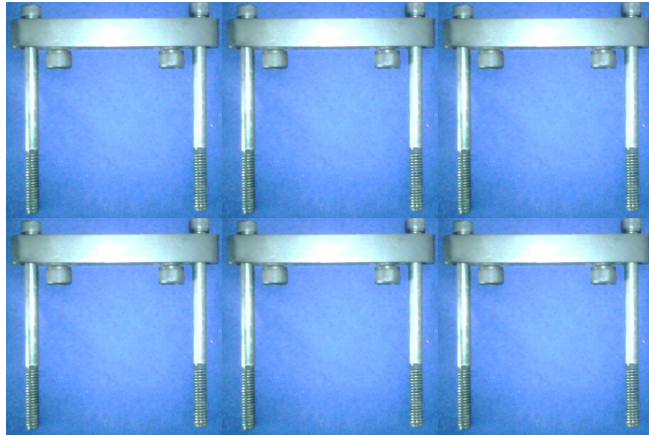
Able to test injectors at a time: **1**

Accessories to be used for testing these injectors

4- Dummy Injectors



6- Injector Retaining Adapters



1- Hose Oil Supply Injector



1- 6.0 L & 4.5 L HEUI Adapter



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Testing Sequence:



IMPORTANT

Every step must be chronologically followed in order to get the best possible results.

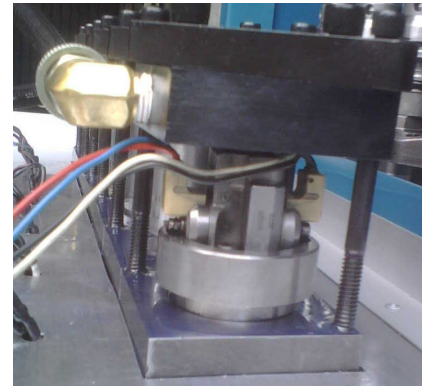
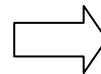
1.- Take out the dummy injectors from the HEUI testing adapters.



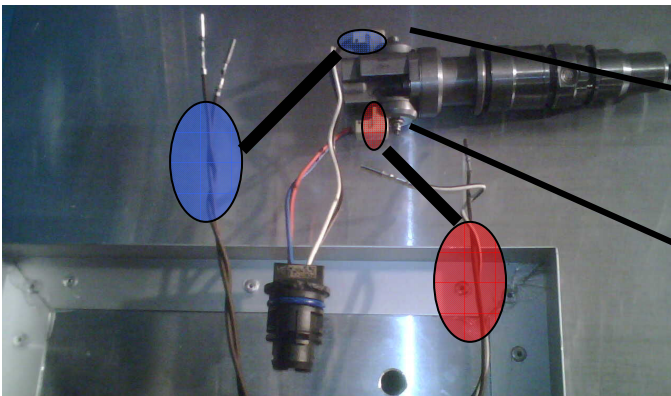
IMPORTANT

Before testing, make sure that all the injectors are cleaned in its inside / outside parts, this is to avoid oil contamination

2.- Place the **6.0 L & 4.5 L HEUI Adapter** in the first HEUI adapter space (from right to left position), then place the 6.0 L or 4.5 L injector over it and press it until it reaches its final position, place also the **hose oil supply injector** in the last adapter space. Place the oil supply plug from the **hose oil supply injector** to the top of the 6.0 L or 4.5 L injector and make sure that they are strongly clamped to the adapter base with the Injector retaining adapters. (Also place the Dummy injectors in the 2, 3, 4, 5, positions from right to left), as shown in the picture.



2.1- Plug the injector with the provided **BLUE TAG** wires as shown in the picture, and cover it with the acrylic protection. (Also make sure that the **RED TAG** Harnesses, the **GREEN** and **YELLOW TAG** wires are not connected so as in **Short Circuit**)



2 pair of wires from 1 solenoid must be connected with 2 pair of wires from the pulse box in the inj, harness

2 pair of wires from 1 solenoid must be connected with 2 pair of wires from the pulse box in the inj harness

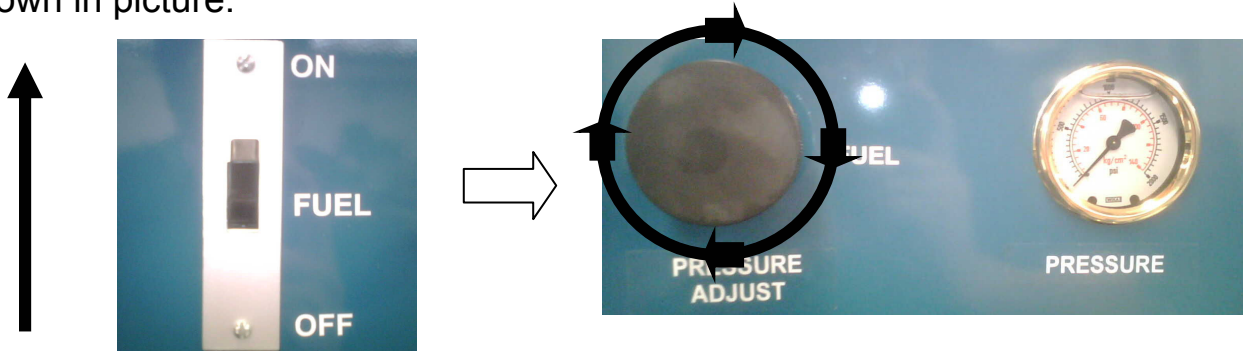


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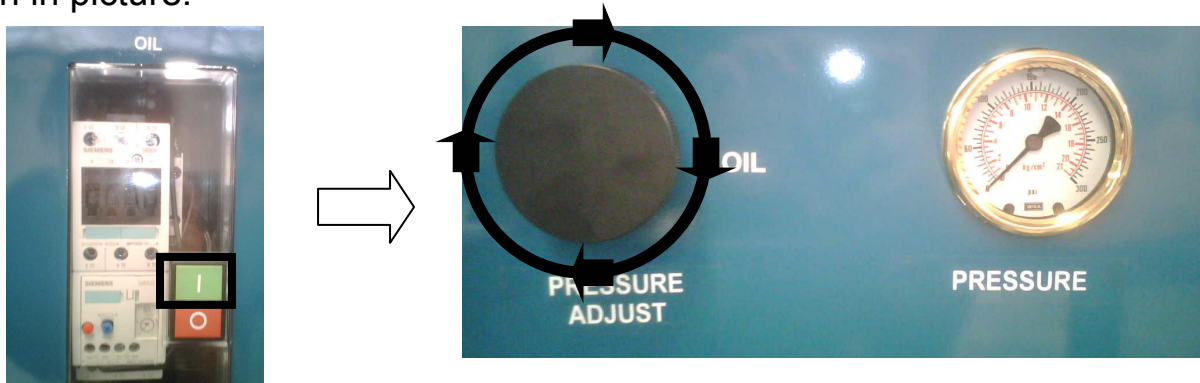
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3.- Turn on the Pulse Box, and set the testing parameters (HEUI mode, Test tube delivery time and RPM's). Now you will hear the sound of the Injector Poppet Valve working at the specified RPM's.

4.- Move the Fuel Pressure switch to "ON" position, and rise the fuel pressure with the fuel pressure valve (moving clockwise) to the desired fuel pressure (we recommend 100 PSI) as shown in picture.



5.- Press the Hydraulic pump switch to "ON", and rise the oil pressure with the oil pressure valve (moving clockwise) to the desired oil pressure (we recommend 750 PSI) as shown in picture.



6.- Now injector should start working. You will see how the injector releases oil pressure in the adapters area, and it start to deliver oil (that plays the fuel role), in the back area of the test tubes, as shown in picture.



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NOTE

NOTE

When testing for the very first time, perform the test with clean and pre-checked working injector.

- 7.- Leave working the injector for about 20 seconds before checking fuel delivery, this is for the injector to eliminate air bubbles from its mechanism.
- 8.- Press the “Start Test” button in the Pulse Box panel to check the fuel delivery in the test tubes for the desired pre-set time, then drain the oil from the test tubes.
- 9.- Repeat step 8 as many times as required until the fuel delivery reading gets stable.
- 10.- Change the RPM's in the Pulse Box panel as desired (Low, mid or high RPM's), and re-arrange the fuel and oil pressures to the desired parameters, this helps us to get steady fuel delivery readings (moving the pressure valves clockwise or counter-clockwise), and repeat step 8 as many times as required until the fuel delivery readings gets stable in each desired RPM Parameter.

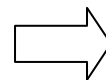
NOTE

NOTE

Take note of the fuel delivery readings and testing parameters and compare between them. This is the main purpose of the tester. **This tester does not fix injectors, just compares between them**

Turn off sequence

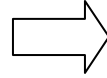
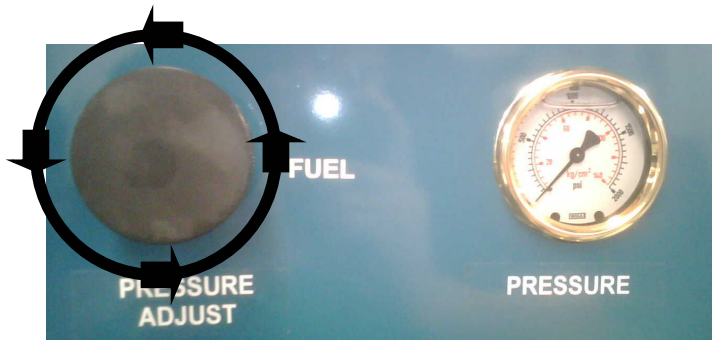
- 11.- After all testing has been performed, we proceed to turn off the tester. First, decrease the oil pressure with the oil pressure valve (moving counter-clockwise) to **almost 0 PSI**, and press the Hydraulic pump switch to “OFF”. As shown in picture.



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12.- Decrease the fuel pressure with the fuel pressure valve (moving counter- clockwise) to **almost** 0 PSI, then move the Fuel Pressure switch to “OFF” position. As shown in picture.



13.- Turn “OFF” the pulse box.

14.- Unplug Harness, take out the injector, the hose Oil Supply Injector and then place the Dummy Injectors in the adapter spaces, and cover them with the acrylic protection. This is for avoiding dust or contamination in the internal piping system.

15.- Testing cycle finished.



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CAT* 3126A / HEUI 3116 Injector

MODE:	Hydraulic Pressure	Fuel Pressure	Test Tube Time	Pulse Box RPM's
HEUI				
Required Parameter	YES	YES	YES	YES
Parameter Values	750 to 1000 PSI	60 to 150 PSI	28 to 32 Sec	300 to 2000 RPM
Recomended Value	750 PSI	100 PSI	30 Sec	Low, 300 RPM Mid, 900 RPM High, 1200 RPM

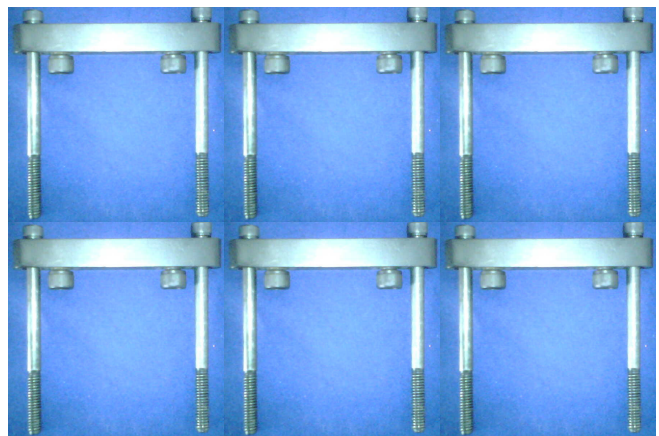
Able to test injectors at a time: **1**

Accessories to be used for testing these injectors

4- Dummy Injectors



6- Injector Retaining Adapters



1- Hose Oil Supply Injector



1- CAT* 3126A / 3116 HEUI Adapter



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Testing Sequence:



IMPORTANT

Every step must be chronologically followed in order to get the best possible results.

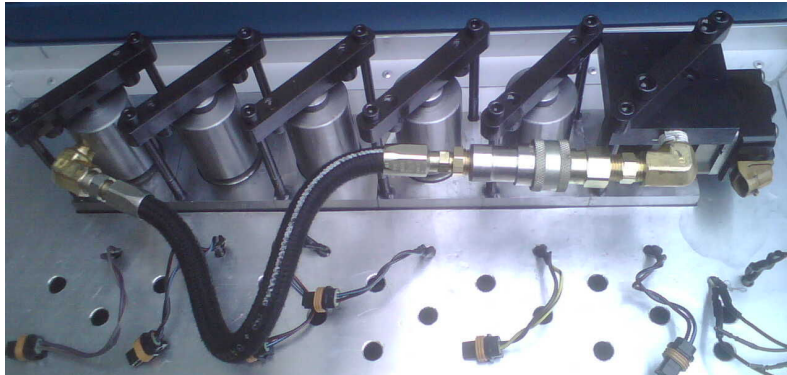
1.- Take out the dummy injectors from the HEUI testing adapters.



IMPORTANT

Before testing, make sure that all the injectors are cleaned in its inside / outside parts, this is to avoid oil contamination

2.- Place the CAT* 3126A / HEUI 3116 Injector in the first HEUI adapter space (from right to left position), place also the **hose oil supply injector** in the last adapter space. Place the oil supply plug from the **hose oil supply injector** to the top of the CAT* 3126A / HEUI 3116 Injector and make sure that they are strongly clamped to the adapter base with the Injector retaining adapters. (Also place the Dummy injectors in the 2, 3, 4, 5, positions from right to left), as shown in the picture.



2.1- Plug the Injector with the provided RED TAG harness and cover them with the acrylic protection as shown in the picture. (Also make sure that the BLUE TAG Harness, the GREEN and YELLOW TAG harnesses are not connected so as in **Short Circuit**)

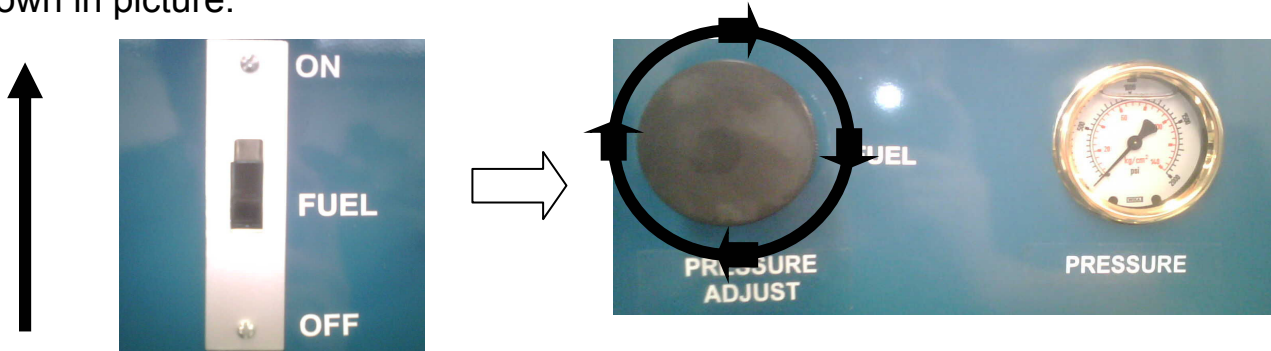


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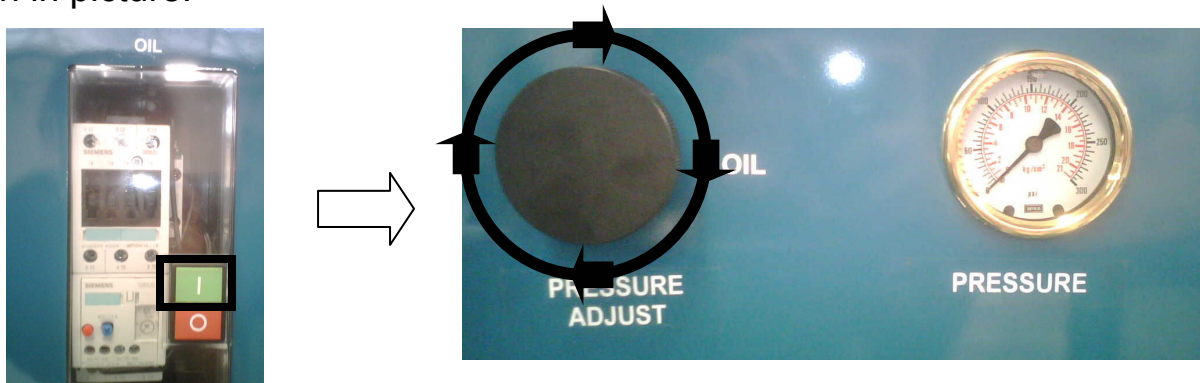
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3.- Turn on the Pulse Box, and set the testing parameters (HEUI mode, Test tube delivery time and RPM's). Now you will hear the sound of the Injector Poppet Valve working at the specified RPM's.

4.- Move the Fuel Pressure switch to "ON" position, and rise the fuel pressure with the fuel pressure valve (moving clockwise) to the desired fuel pressure (we recommend 100 PSI) as shown in picture.



5.- Press the Hydraulic pump switch to "ON", and rise the oil pressure with the oil pressure valve (moving clockwise) to the desired oil pressure (we recommend 750 PSI) as shown in picture.



6.- Now injector should start working. You will see how the injector releases oil pressure in the adapters area, and it start to deliver oil (that plays the fuel role), in the back area of the test tubes, as shown in picture.



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NOTE

NOTE

When testing for the very first time, perform the test with clean and pre-checked working injector.

- 7.- Leave working the injector for about 20 seconds before checking fuel delivery, this is for the injector to eliminate air bubbles from its mechanism.
- 8.- Press the “Start Test” button in the Pulse Box panel to check the fuel delivery in the test tubes for the desired pre-set time, then drain the oil from the test tubes.
- 9.- Repeat step 8 as many times as required until the fuel delivery reading gets stable.
- 10.- Change the RPM's in the Pulse Box panel as desired (Low, mid or high RPM's), and re-arrange the fuel and oil pressures to the desired parameters, this helps us to get steady fuel delivery readings (moving the pressure valves clockwise or counter-clockwise), and repeat step 8 as many times as required until the fuel delivery readings gets stable in each desired RPM Parameter.

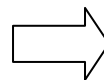
NOTE

NOTE

Take note of the fuel delivery readings and testing parameters and compare between them. This is the main purpose of the tester. **This tester does not fix injectors, just compares between them**

Turn off sequence

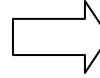
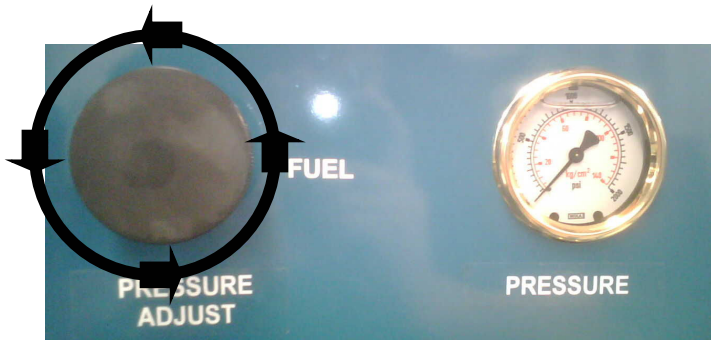
- 11.- After all testing has been performed, we proceed to turn off the tester. First, decrease the oil pressure with the oil pressure valve (moving counter-clockwise) to **almost** 0 PSI, and press the Hydraulic pump switch to “OFF”. As shown in picture.



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12.- Decrease the fuel pressure with the fuel pressure valve (moving counter- clockwise) to **almost** 0 PSI, then move the Fuel Pressure switch to “OFF” position. As shown in picture.



13.- Turn “OFF” the pulse box.

14.- Unplug Harness, take out the injector, the hose Oil Supply Injector and then place the Dummy Injectors in the adapter spaces, and cover them with the acrylic protection. This is for avoiding dust or contamination in the internal piping system.

15.- Testing cycle finished.



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EUI Injector Tests

Cummins* Celect*, N-14 / M-11 EUI Injector

MODE:	Hydraulic Pressure	Fuel Pressure	Test Tube Time	Pulse Box RPM's
EUI				
Required Parameter	NO	YES	YES	AUTO
Parameter Values	-	60 to 150 PSI	28 to 32 Sec	900 RPM Fixed
Recomended Value	-	100 PSI	30 Sec	900 RPM Fixed

Able to test injectors at a time: **1**

Accessories to be used for testing these injectors

1 Cummins* Celect*, N-14 / M-11 EUI Injector Adapter



1 Cummins* Celect*, N-14 / M-11 EUI Injector Link screw (concaves head)



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Testing Sequence:



IMPORTANT

Every step must be chronologically followed in order to get the best possible results.

1.- Make sure that the 6 Dummy injectors are placed in its correct positions (adapter spaces) and verify that they are strongly clamped to the adapter base with the Injector retaining adapters as shown. (this is to avoid pressure loose in the oil piping) Remember always to perform this step before testing any EUI injector



IMPORTANT

Before testing, make sure that all the injectors are cleaned in its inside / outside parts, this is to avoid oil contamination

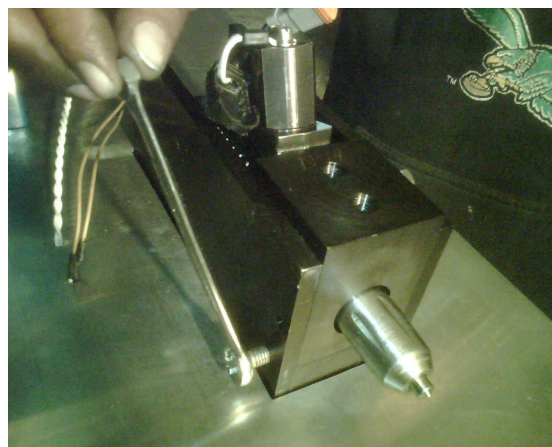
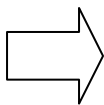
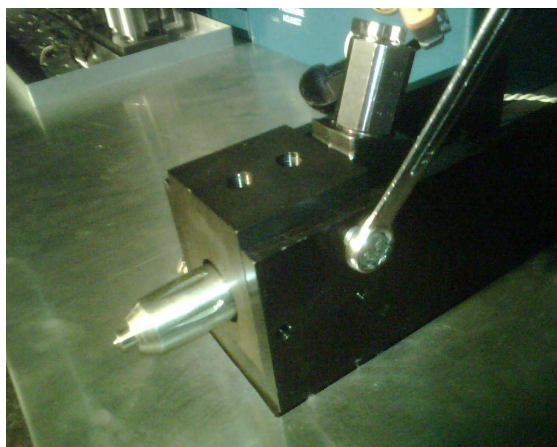
2.- Cover the external O-ring's with yellow or green automotive grease and place the Cummins Celect Injector in its correct adapter (N-14 or M-11 type) as shown in picture



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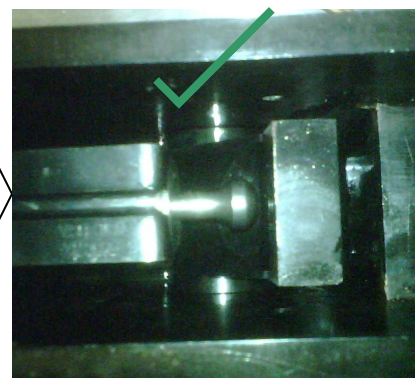
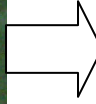
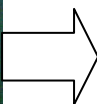
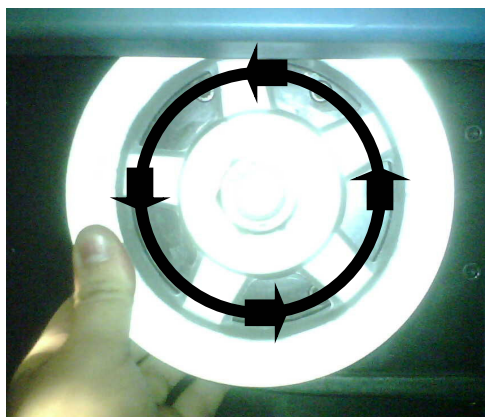
3.- Place the EUI injector with its adapter in the CAM BOX, and strongly tighten the retaining screws, as shown in picture.



4.- Open the CAM BOX side door where the CAM shaft pulley is located.



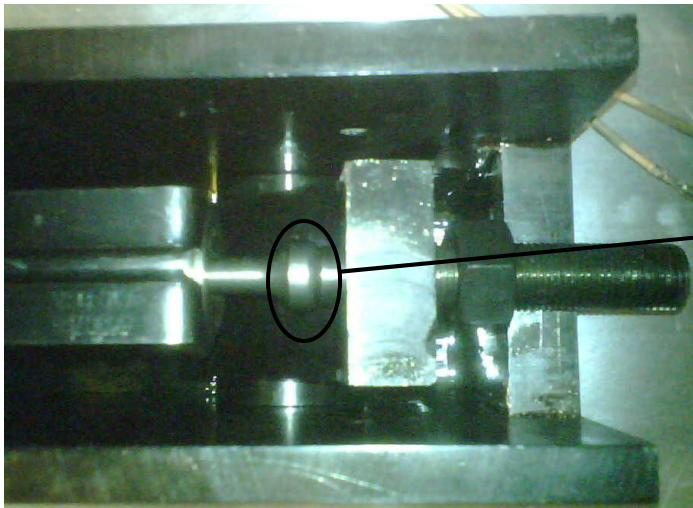
5.- Spindle by hand the **CAM shaft** with the **CAM shaft pulley** in order to find the **LOWEST CAM PROFILE POINT** (in other words, the roller part of the **CAM BOX** where the link is placed should be as far as possible from the **Injector follower part**), as shown in the pictures.



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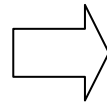
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6.- Then, assembly the **Cummins* Celect*, N-14 / M-11 EUI Injector Link** screw to the roller, till it slightly touches the injector follower part, as shown in picture

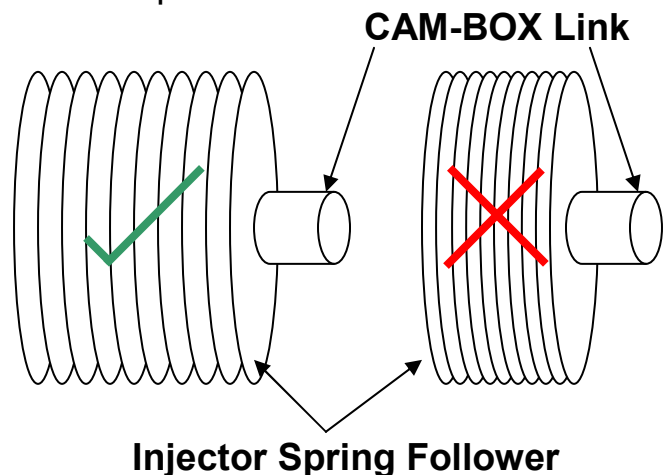
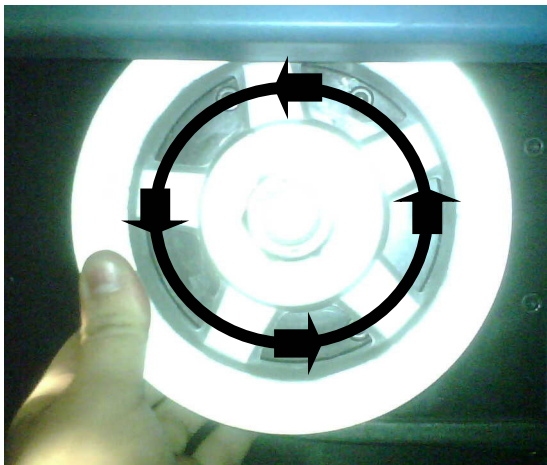


Slight Contact only.

7.- Then screw the **Cummins* Celect*, N-14 / M-11 EUI Injector Link** until the follower part of the injector diminish **2 linear millimeters** (more less 2 screw rounds after the link screw slightly touches the injector follower part), and tighten the lock nut to the roller, as shown in picture.



8.- Spindle by hand the **CAM shaft** with the **CAM shaft pulley** to verify that the CAM has **free** rotary movement and **free** Injector linear movement (It can happens that the Injector is too much tightened with the link screw that it is not able to move or to rotate and gets clogged as in the extreme right diagram) as shown in picture.



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IMPORTANT

If the **CAM DOES NOT HAVE FREELY ROTARY / INJECTOR LINEAR MOVEMENT**, after CAM BOX switch is turned “ON”, it could cause several damage to the CAM BOX electrical motor / pulleys / bands.

9.- If the CAM has freely rotary / injector linear movement, close the CAM BOX side door in order to continue.

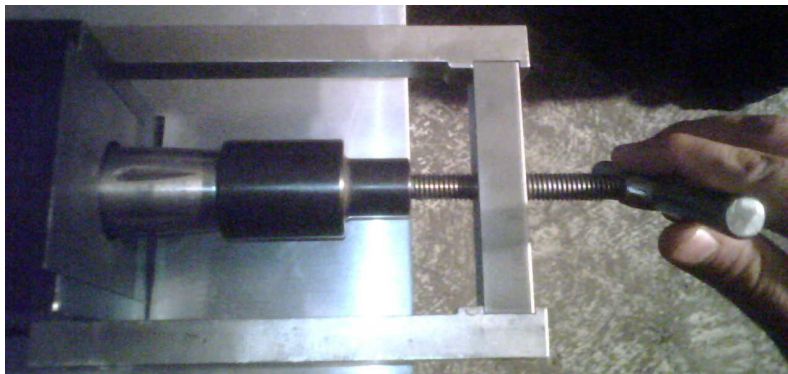


IMPORTANT

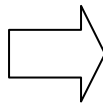
Risk of death or serious injury can be caused if the CAM BOX side door is not closed before the CAM BOX switch is turned “ON”

10.- If the **CAM DOES NOT HAVE FREELY ROTARY / INJECTOR LINEAR MOVEMENT**, repeat step No. 7 with a less distance (1 linear millimeter or less) until the CAM has freely rotary / injector linear movement, and then follow step No. 9

11.- Then place the CAM BOX nozzle catcher to the **Celect***, **N-14 / M-11 EUI Injector** nozzle, and give a normal strength tighten to the nozzle catcher as shown in picture (**too much strength tighten in the nozzle catcher could cause injector to pull out from its adapter, and injector will not work**)



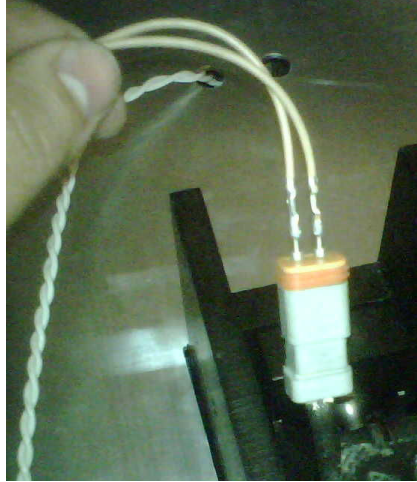
12.- Now, plug the fuel pressure hose and fuel return hose (if available) to the **Celect***, **N-14 / M-11 EUI Injector** adapter.



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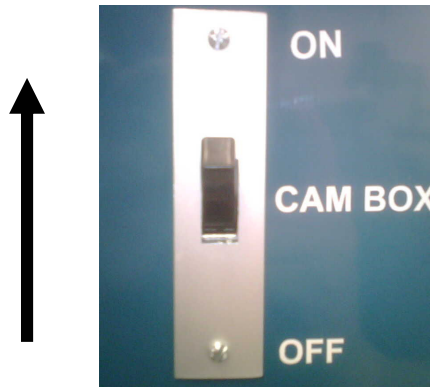
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13.- Plug the Injector with the provided GREEN TAG wire and cover them with the acrylic protection as shown in the picture. (Also make sure that the BLUE TAG Harness, the RED and YELLOW TAG harnesses / wires are not connected so as in **Short Circuit**)



14.- Turn on the Pulse Box, and set the testing mode to **EUI** mode, then open the CAM BOX side door and spindle by hand the CAM Shaft pulley several times (this is for the operator to hear the sound of the Injector Poppet Valve working with the solenoid.). RPM tachometer must mark **RPM=000X10** Then set the test tube delivery time to the desired time, then close the CAM BOX side door.

15.- Move the CAM BOX switch to “ON” position as shown in picture, then CAM BOX motor will start working.



CAUTION

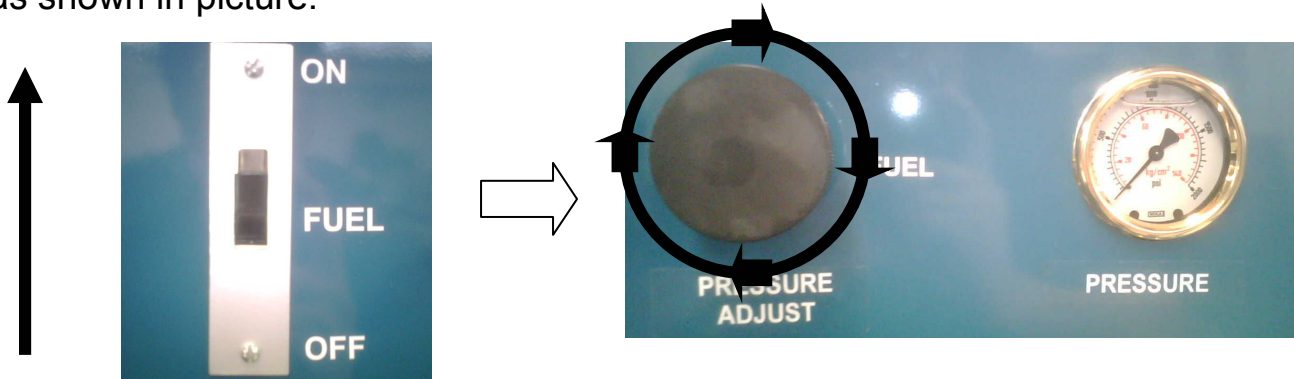
Keep out from all moving parts when installing or testing with the machine



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16.- Move the Fuel Pressure switch to “ON” position, and rise the fuel pressure with the fuel pressure valve (moving clockwise) to the desired fuel pressure (we recommend 100 PSI) as shown in picture.



17.- Now injector should start working and it starts to deliver oil (that plays the fuel role), in the back area of the test tubes, as shown in picture.



NOTE **NOTE** When testing for the very first time, perform the test with clean and pre-checked working injector.

18.- Leave working the injector for about 20 seconds before checking fuel delivery, this is for the injector to eliminate air bubbles from its mechanism.

19.- Press the “Start Test” button in the Pulse Box panel to check the fuel delivery in the test tube for the desired pre-set time, then drain the oil from the test tube.

20.- Repeat step 19 as many times as required until the fuel delivery reading gets stable.

NOTE **NOTE** Take note of the fuel delivery readings and testing parameters and compare between them. This is the main purpose of the tester. **This tester does not fix injectors, just compares between them**

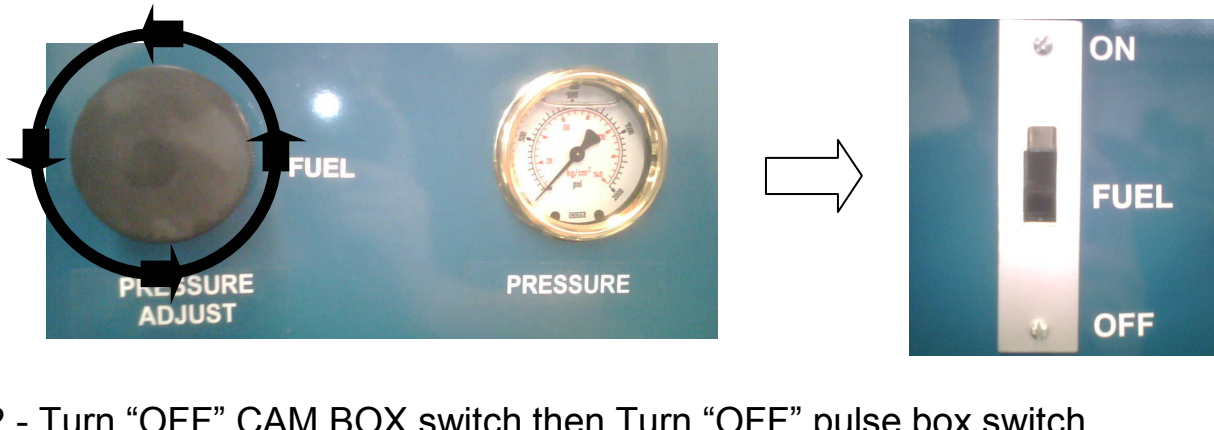


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Turn off sequence

21.- After all testing has been performed, we proceed to turn off the tester. First, decrease the fuel pressure with the fuel pressure valve (moving counter- clockwise) to **almost 0** PSI, then move the Fuel Pressure switch to “OFF” position. As shown in picture.



22.- Turn “OFF” CAM BOX switch then Turn “OFF” pulse box switch.

14.- Unplug Harness, take out the injector starting with the CAM BOX nozzle catcher, then the screw link, and at the end with the Injector Adapter.

23.- Testing cycle finished.



Detroit Diesel Series 60* EUI Injector

MODE:	Hydraulic Pressure	Fuel Pressure	Test Tube Time	Pulse Box RPM's
EUI				
Required Parameter	NO	YES	YES	AUTO
Parameter Values	-	60 to 150 PSI	28 to 32 Sec	900 RPM Fixed
Recomendad Value	-	100 PSI	30 Sec	900 RPM Fixed

Able to test injectors at a time: **1**

Accessories to be used for testing these injectors

1 Detroit Diesel Series 60*
EUI Injector Adapter



1 Detroit Diesel Series 60*
EUI Injector Link screw (Planar head)



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Testing Sequence:



IMPORTANT

Every step must be chronologically followed in order to get the best possible results.

1.- Make sure that the 6 Dummy injectors are placed in its correct positions (adapter spaces) and verify that they are strongly clamped to the adapter base with the Injector retaining adapters as shown. (this is to avoid pressure loose in the oil piping) Remember always to perform this step before testing any EUI injector



IMPORTANT

Before testing, make sure that all the injectors are cleaned in its inside / outside parts, this is to avoid oil contamination

2.- Cover the external O-ring's with yellow or green automotive grease and place the Detroit Diesel Series 60* Injector in its correct adapter as shown in picture



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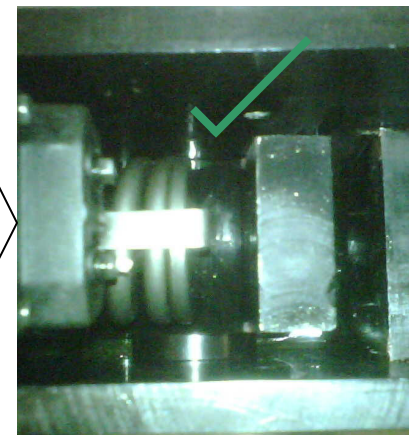
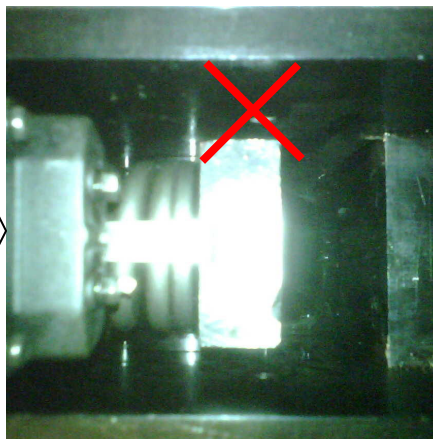
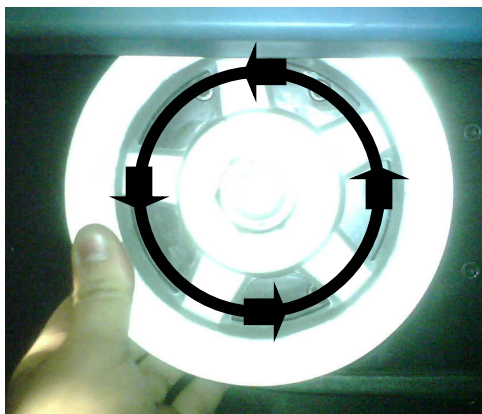
3.- Place the EUI injector with its adapter in the CAM BOX, and strongly tighten the retaining screws, as shown in picture.



4.- Open the CAM BOX side door where the CAM shaft pulley is located.



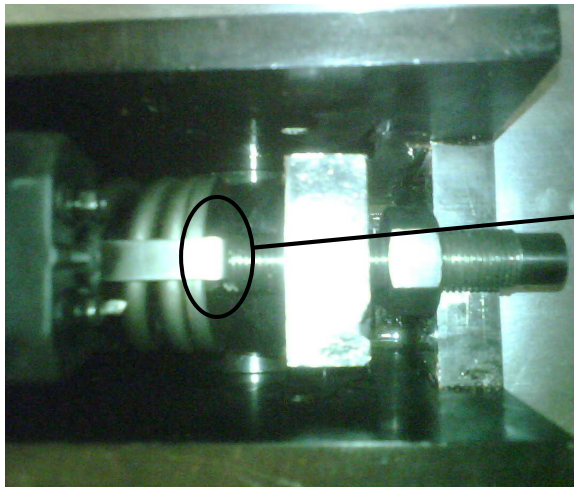
5.- Spindle by hand the **CAM shaft** with the **CAM shaft pulley** in order to find the **LOWEST CAM PROFILE POINT** (in other words, the roller part of the **CAM BOX** where the link is placed should be as far as possible from the **Injector follower part**), as shown in the pictures.



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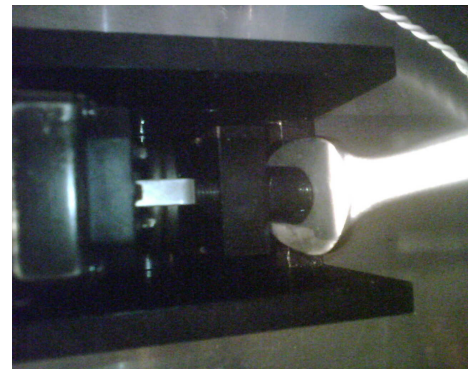
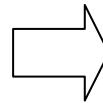
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6.- Then, assembly the **Detroit Diesel Series 60* EUI Injector Link** screw to the roller, till it slightly touches the injector follower part, as shown in picture

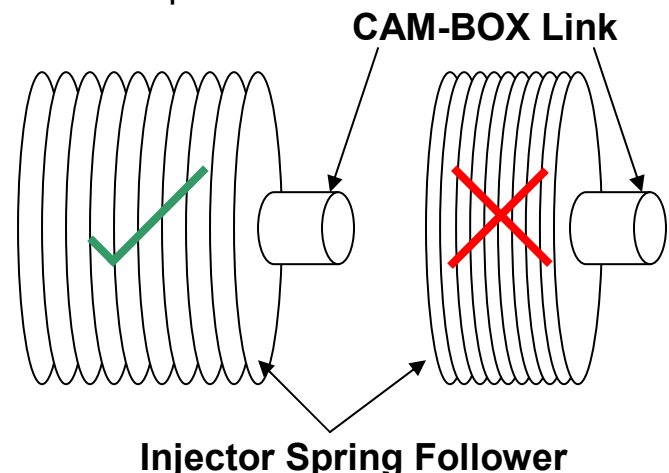
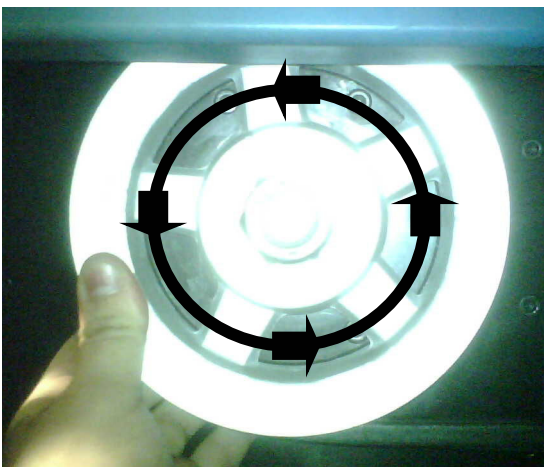


Slight Contact only.

7.- Then screw the **Detroit Diesel Series 60* EUI Injector Link** until the follower part of the injector diminish **2 linear millimeters** (more less 2 screw rounds after the link screw slightly touches the injector follower part), and tighten the lock nut to the roller, as shown in picture.



8.- Spindle by hand the **CAM shaft** with the **CAM shaft pulley** to verify that the CAM has **free** rotary movement and **free** Injector linear movement (It can happens that the Injector is too much tightened with the link screw that it is not able to move or to rotate and gets clogged as in the extreme right diagram) as shown in picture.



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IMPORTANT

If the **CAM DOES NOT HAVE FREELY ROTARY / INJECTOR LINEAR MOVEMENT**, after CAM BOX switch is turned “ON”, it could cause several damage to the CAM BOX electrical motor / pulleys / bands.

9.- If the CAM has freely rotary / injector linear movement, close the CAM BOX side door in order to continue.



IMPORTANT

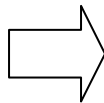
Risk of death or serious injury can be caused if the CAM BOX side door is not closed before the CAM BOX switch is turned “ON”

10.- If the **CAM DOES NOT HAVE FREELY ROTARY / INJECTOR LINEAR MOVEMENT**, repeat step No. 7 with a less distance (1 linear millimeter or less) until the CAM has freely rotary / injector linear movement, and then follow step No. 9

11.- Then place the CAM BOX nozzle catcher to the **Detroit Diesel Series 60* EUI Injector** nozzle, and give a normal strength tighten to the nozzle catcher as shown in picture (**too much strength tighten in the nozzle catcher could cause injector to pull out from its adapter, and injector will not work**)



12.- Now, plug the fuel pressure hose and to the **Detroit Diesel Series 60* EUI Injector** adapter.



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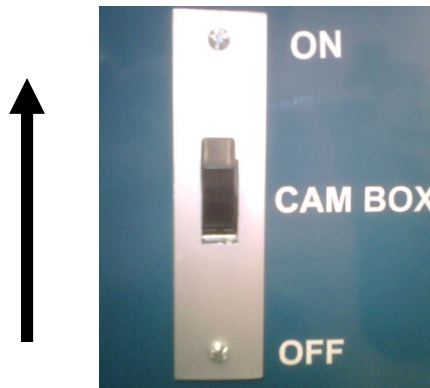
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13.- Plug the Injector with the provided YELLOW TAG wire and cover them with the acrylic protection as shown in the picture. (Also make sure that the BLUE TAG Harness, the RED and GREEN TAG harnesses / wires are not connected so as in **Short Circuit**)



14.- Turn on the Pulse Box, and set the testing mode to **EUI** mode, then open the CAM BOX side door and spindle by hand the CAM Shaft pulley several times (this is for the operator to hear the sound of the Injector Poppet Valve working with the solenoid.). RPM tachometer must mark **RPM=000X10** Then set the test tube delivery time to the desired time, then close the CAM BOX side door.

15.- Move the CAM BOX switch to “ON” position as shown in picture, then CAM BOX motor will start working.



CAUTION

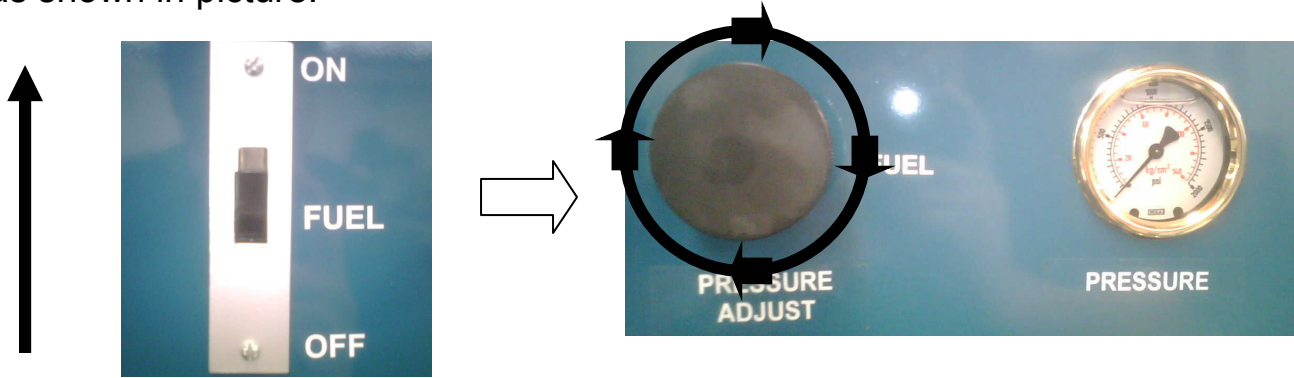
Keep out from all moving parts when installing or testing with the machine



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16.- Move the Fuel Pressure switch to “ON” position, and rise the fuel pressure with the fuel pressure valve (moving clockwise) to the desired fuel pressure (we recommend 100 PSI) as shown in picture.



17.- Now injector should start working and it starts to deliver oil (that plays the fuel role), in the back area of the test tubes, as shown in picture.



NOTE **NOTE** When testing for the very first time, perform the test with clean and pre-checked working injector.

18.- Leave working the injector for about 20 seconds before checking fuel delivery, this is for the injector to eliminate air bubbles from its mechanism.

19.- Press the “Start Test” button in the Pulse Box panel to check the fuel delivery in the test tube for the desired pre-set time, then drain the oil from the test tube.

20.- Repeat step 19 as many times as required until the fuel delivery reading gets stable.

NOTE **NOTE** Take note of the fuel delivery readings and testing parameters and compare between them. This is the main purpose of the tester. **This tester does not fix injectors, just compares between them**

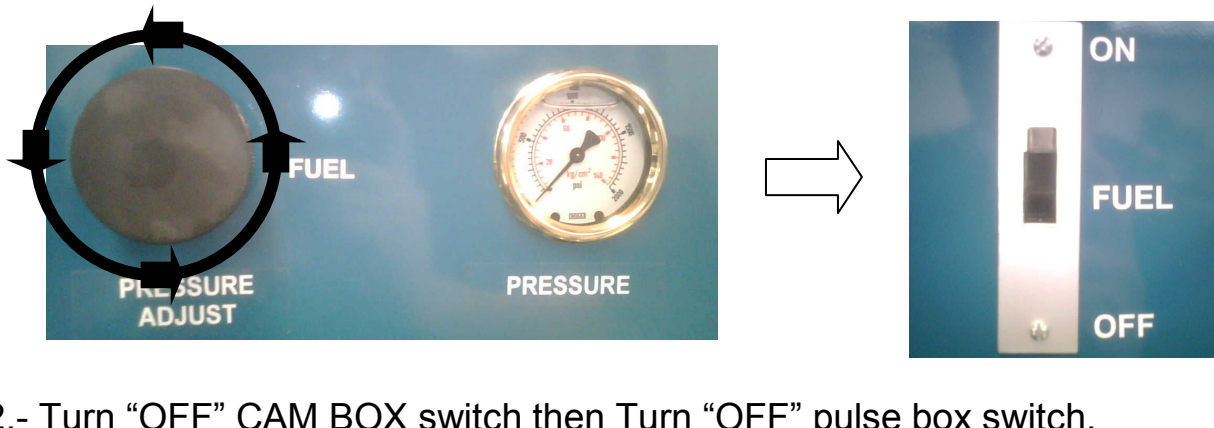


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Turn off sequence

21.- After all testing has been performed, we proceed to turn off the tester. First, decrease the fuel pressure with the fuel pressure valve (moving counter- clockwise) to **almost 0** PSI, then move the Fuel Pressure switch to “OFF” position. As shown in picture.



22.- Turn “OFF” CAM BOX switch then Turn “OFF” pulse box switch.

14.- Unplug Harness, take out the injector starting with the CAM BOX nozzle catcher, then the screw link, and at the end with the Injector Adapter.

23.- Testing cycle finished.



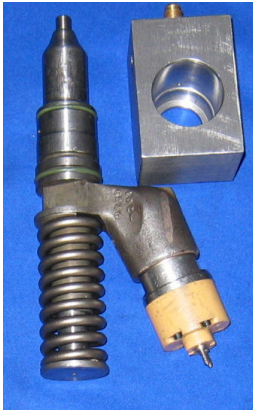
CAT* 3406E EUI Injector

MODE:	Hydraulic Pressure	Fuel Pressure	Test Tube Time	Pulse Box RPM's
EUI				
Required Parameter	NO	YES	YES	AUTO
Parameter Values	-	60 to 150 PSI	28 to 32 Sec	900 RPM Fixed
Recomended Value	-	100 PSI	30 Sec	900 RPM Fixed

Able to test injectors at a time: **1**

Accessories to be used for testing these injectors

1 CAT* 3406E EUI Injector Adapter



1 CAT* 3406E EUI Injector Link screw
(Planar Head, same as Series 60 Link Screw)



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Testing Sequence:



IMPORTANT

Every step must be chronologically followed in order to get the best possible results.

1.- Make sure that the 6 Dummy injectors are placed in its correct positions (adapter spaces) and verify that they are strongly clamped to the adapter base with the Injector retaining adapters as shown. (this is to avoid pressure loose in the oil piping) Remember always to perform this step before testing any EUI injector



IMPORTANT

Before testing, make sure that all the injectors are cleaned in its inside / outside parts, this is to avoid oil contamination

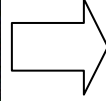
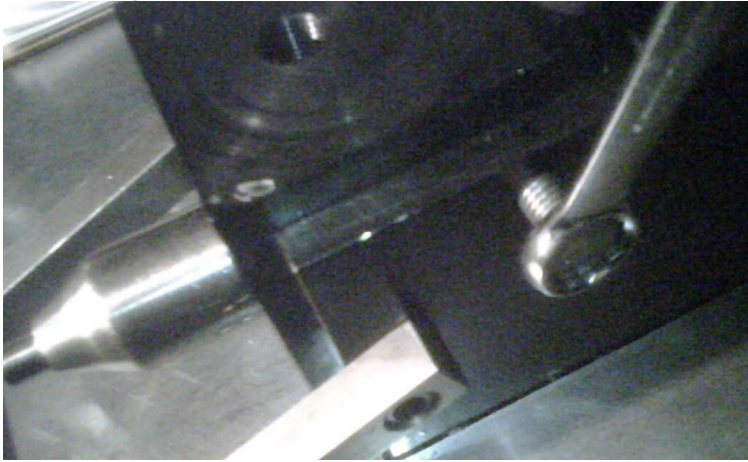
2.- Cover the external O-ring's with yellow or green automotive grease and place the CAT* 3406E EUI Injector in its correct adapter as shown in picture



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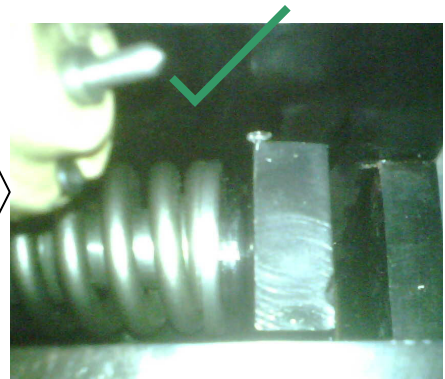
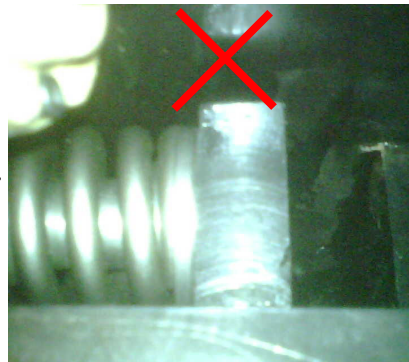
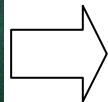
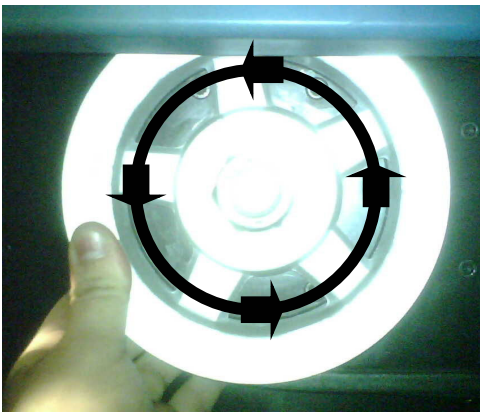
3.- Place the EUI injector with its adapter in the CAM BOX, and strongly tighten the retaining screws, as shown in picture.



4.- Open the CAM BOX side door where the CAM shaft pulley is located.



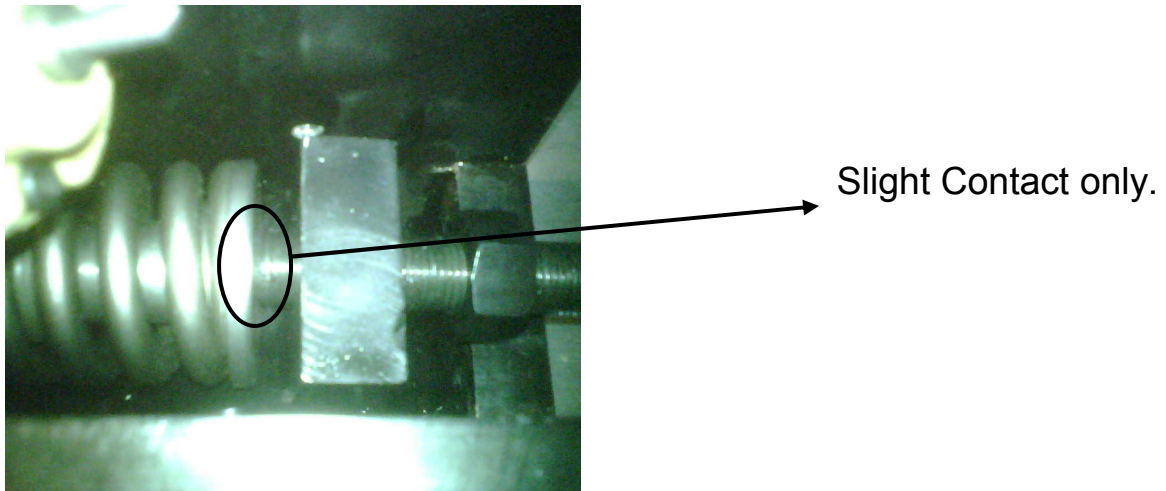
5.- Spindle by hand the **CAM shaft** with the **CAM shaft pulley** in order to find the **LOWEST CAM PROFILE POINT** (in other words, the roller part of the CAM BOX where the link is placed should be as far as possible from the Injector follower part), as shown in the pictures.



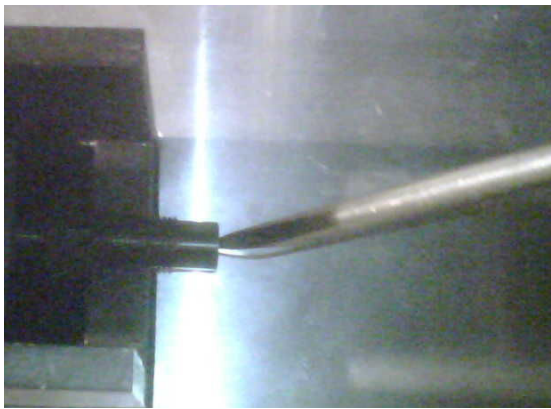
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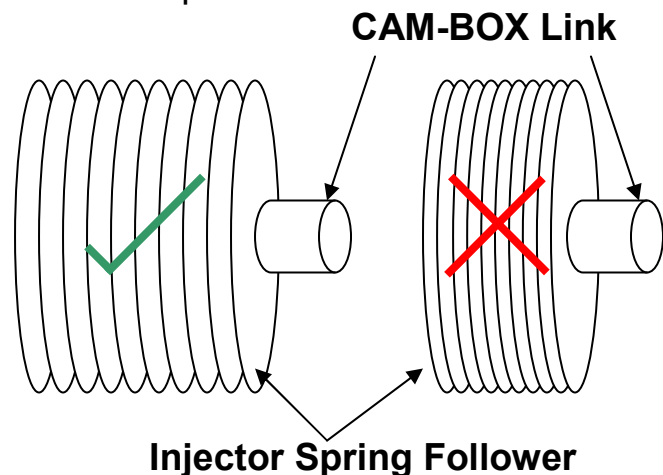
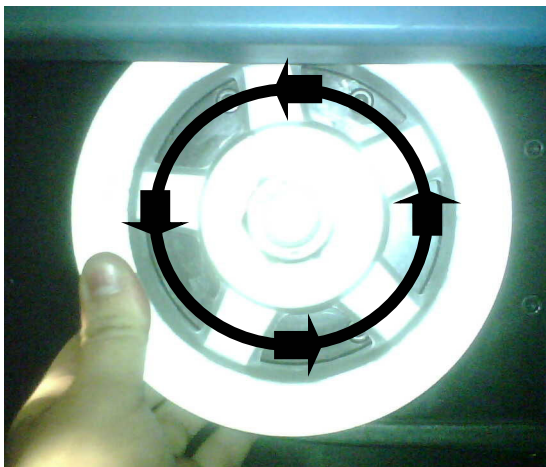
6.- Then, assembly the **CAT* 3406E EUI Injector Link** screw to the roller, till it slightly touches the injector follower part, as shown in picture



7.- Then screw the **CAT* 3406E EUI Injector Link** until the follower part of the injector diminish **2 linear millimeters** (more less 2 screw rounds after the link screw slightly touches the injector follower part), and tighten the lock nut to the roller, as shown in picture.



8.- Spindle by hand the **CAM shaft** with the **CAM shaft pulley** to verify that the CAM has **free** rotary movement and **free** Injector linear movement (It can happens that the Injector is too much tightened with the link screw that it is not able to move or to rotate and gets clogged as in the extreme right diagram) as shown in picture.



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IMPORTANT

If the **CAM DOES NOT HAVE FREELY ROTARY / INJECTOR LINEAR MOVEMENT**, after CAM BOX switch is turned “ON”, it could cause several damage to the CAM BOX electrical motor / pulleys / bands.

9.- If the CAM has freely rotary / injector linear movement, close the CAM BOX side door in order to continue.

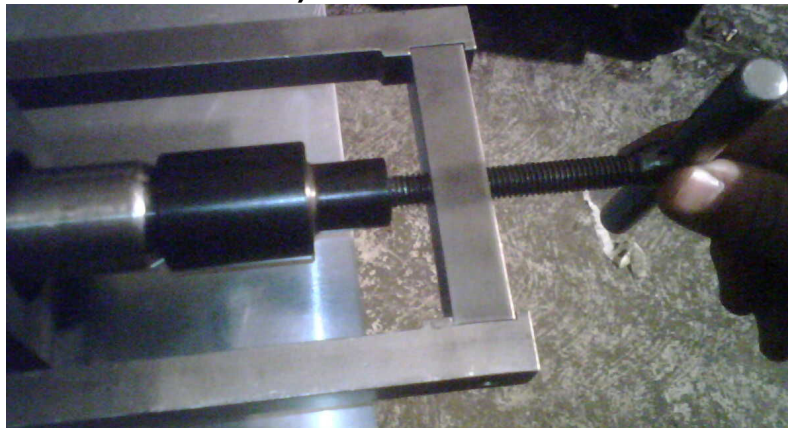


IMPORTANT

Risk of death or serious injury can be caused if the CAM BOX side door is not closed before the CAM BOX switch is turned “ON”

10.- If the **CAM DOES NOT HAVE FREELY ROTARY / INJECTOR LINEAR MOVEMENT**, repeat step No. 7 with a less distance (1 linear millimeter or less) until the CAM has freely rotary / injector linear movement, and then follow step No. 9

11.- Then place the CAM BOX nozzle catcher to the **CAT* 3406E EUI Injector** nozzle, and give a normal strength tighten to the nozzle catcher as shown in picture (**too much strength tighten in the nozzle catcher could cause injector to pull out from its adapter, and injector will not work**)



12.- Now, plug the fuel pressure hose to the **CAT* 3406E EUI Injector** adapter.



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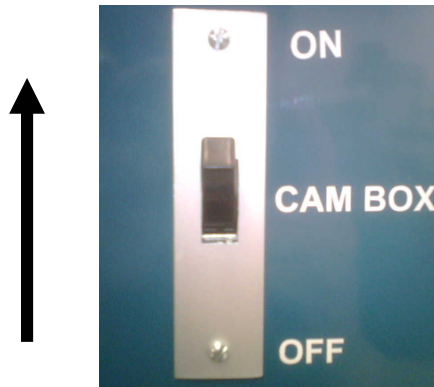
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13.- Plug the Injector with the provided YELLOW TAG wire and cover them with the acrylic protection as shown in the picture. (Also make sure that the BLUE TAG Harness, the RED and GREEN TAG harnesses / wires are not connected so as in **Short Circuit**)



14.- Turn on the Pulse Box, and set the testing mode to **EUI** mode, then open the CAM BOX side door and spindle by hand the CAM Shaft pulley several times (this is for the operator to hear the sound of the Injector Poppet Valve working with the solenoid.). RPM tachometer must mark **RPM=000X10** Then set the test tube delivery time to the desired time, then close the CAM BOX side door.

15.- Move the CAM BOX switch to “ON” position as shown in picture, then CAM BOX motor will start working.



CAUTION

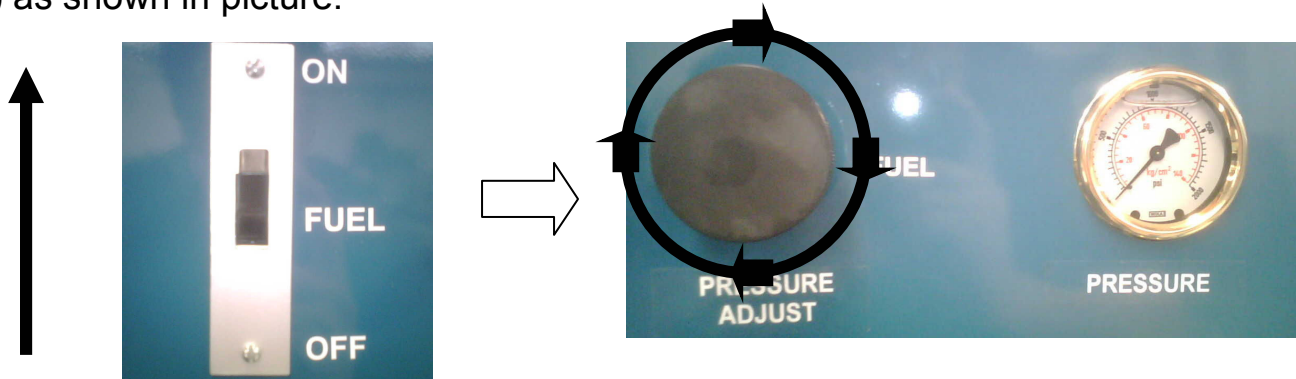
Keep out from all moving parts when installing or testing with the machine



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16.- Move the Fuel Pressure switch to “ON” position, and rise the fuel pressure with the fuel pressure valve (moving clockwise) to the desired fuel pressure (we recommend 100 PSI) as shown in picture.



17.- Now injector should start working and it starts to deliver oil (that plays the fuel role), in the back area of the test tubes, as shown in picture.



NOTE When testing for the very first time, perform the test with clean and pre-checked working injector.

18.- Leave working the injector for about 20 seconds before checking fuel delivery, this is for the injector to eliminate air bubbles from its mechanism.

19.- Press the “Start Test” button in the Pulse Box panel to check the fuel delivery in the test tube for the desired pre-set time, then drain the oil from the test tube.

20.- Repeat step 19 as many times as required until the fuel delivery reading gets stable.

NOTE Take note of the fuel delivery readings and testing parameters and compare between them. This is the main purpose of the tester. **This tester does not fix injectors, just compares between them**



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Turn off sequence

21.- After all testing has been performed, we proceed to turn off the tester. First, decrease the fuel pressure with the fuel pressure valve (moving counter- clockwise) to **almost 0** PSI, then move the Fuel Pressure switch to “OFF” position. As shown in picture.

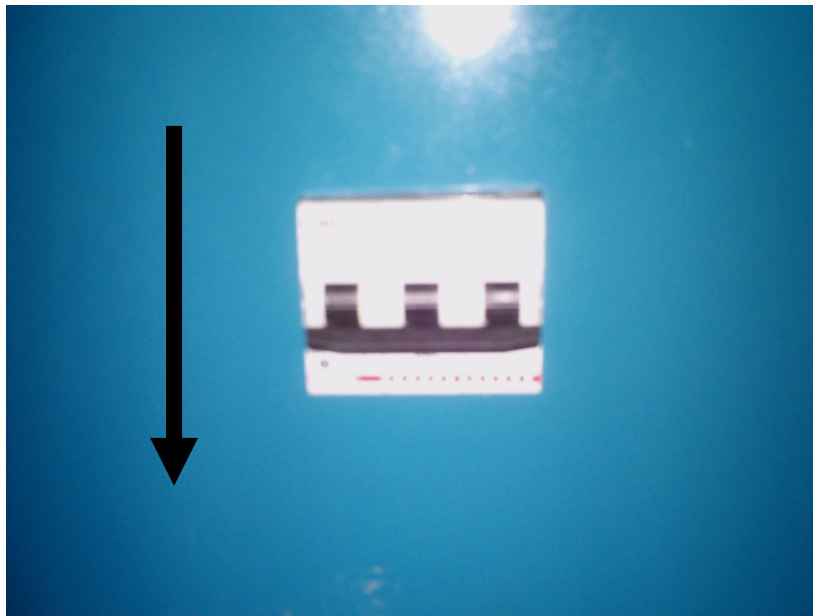


22.- Turn “OFF” CAM BOX switch then Turn “OFF” pulse box switch.

14.- Unplug Harness, take out the injector starting with the CAM BOX nozzle catcher, then the screw link, and at the end with the Injector Adapter.

23.- Testing cycle finished.

Turn off the Main Switch after all the testing has been performed



*These names are used for reference purpose only, and do not imply that we represent these brands.



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Recommendations

If the operator finds something wrong with the DPA-240 tester when working, (for example: Fuel delivery pan does not returns to its initial place after the test tubes delivery times has ended or when pressing the “Start test” button the fuel pan does not react) usually what the operator only has to do is to press the System Reset Button located in the Pulse Box panel, and everything should be corrected.

If the DPA-240 does not starts, please check the service disconnecting means / fuses or electricity connections in the electrical power supply

NEVER LEAVE THE DPA-240 TESTER WORKING IN 2 OR 1 ELECTRIC PHASES ONLY. This could cause several damage to the electric motors / wiring.

It is recommendable not to take the tester to its parameter limits (excessive oil / fuel pressure during long operating times)

It is recommendable to change the oil from the tank every 300 hours of operation (about 1 year)



Limited Warranty

Diesel Parts of America, North Hollywood CA, warrants to Customer that all new and unused Equipment furnished by Diesel Parts of America is free from defect in workmanship and material as of the time and place of delivery by Diesel Parts of America. Such electric motors, electric equipment, accessories or other items manufactured by others are subject to the warranty of their respective manufacturers. At the present time the manufacturer's warranty on the DPA-230 test equipment is limited to 1 year.

In the case of Diesel Parts of America breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be, at Diesel Parts of America options, (1) repair or (2) replacement or where authorized in writing Diesel Parts of America in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Diesel Parts of America service station or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Upon receipt of notice of apparent defect of failure Diesel Parts of America shall instruct the claimant on the warranty claim procedures to be followed.

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NOTES



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